Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602622A: *Chemical, Smoke and Equipment Defeating Technology*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	8.706	5.324	4.877	-	4.877	4.431	4.471	3.067	1.195	Continuing	Continuing
552: *SMOKE/NOVEL EFFECT MUN*	5.125	5.324	4.877	-	4.877	4.431	4.471	3.067	1.195	Continuing	Continuing
BA1: *Protection Technologies (CA)*	3.581	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

FY10 funding realigned to higher priority efforts.

A. Mission Description and Budget Item Justification

The objective of this program element (PE) is to investigate and evaluate obscurant technologies to increase personnel and platform survivability and develop and validate forensic analysis methods for military and homemade explosive devices, including their precursors and residue. This PE pursues research in materials science and dissemination methodologies and mechanisms and technologies and techniques to enable forensic analysis of explosive signatures (project 552).

Work in this PE is related to, and fully coordinated with, PE 0603004A/project L97 (Smoke and Obscurants Advanced Technology) and PE 0603606A/project 608 (Countermine & Barrier Development).

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

This work is performed by the Army Research, Development, and Engineering Command (RDECOM), Edgewood Chemical Biological Center (ECBC), Edgewood, MD.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	13.622	5.324	4.877	-	4.877
Current President's Budget	8.706	5.324	4.877	-	4.877
Total Adjustments	-4.916	-	-	-	-
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-4.775	-			
• SBIR/STTR Transfer	-0.141	-			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602622A: *Chemical, Smoke and Equipment Defeating Technology*	PROJECT 552: *SMOKE/NOVEL EFFECT MUN*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
552: *SMOKE/NOVEL EFFECT MUN*	5.125	5.324	4.877	-	4.877	4.431	4.471	3.067	1.195	Continuing	Continuing

A. Mission Description and Budget Item Justification

The project investigates and evaluates obscurant technologies that degrade threat force surveillance sensors and defeat the enemy's target acquisition devices, missile guidance, and directed energy weapons. This project investigates advanced infra-red (IR) and multi-spectral obscurant materials that provide effective, affordable, and efficient screening of deployed forces, while being safe and environmentally acceptable. Additionally, it researches and investigates forensic analysis technology in explosives and explosives-related chemical signatures, and develops and validates field sampling and forensics methods for use in a forward-deployed laboratory.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Army Research, Development, and Engineering Command (RDECOM), Edgewood Chemical Biological Center (ECBC), Edgewood, MD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Advanced Obscurants ***Description:*** This effort investigates technologies which enable safe, effective screening of personnel and equipment. ***FY 2010 Accomplishments:*** Investigated, through chamber and field evaluation, bi-spectral packaging and dissemination concepts to improve overall obscuration performance. ***FY 2011 Plans:*** Develop, refine and optimize bi-spectral packaging and dissemination concepts through testing and modifications to make them suitable for weaponization. ***FY 2012 Plans:*** Will evaluate optimized bispectral materials and initiate analysis of spectrally selective obscurant concepts	1.427	1.400	1.400
Title: Obscurant Enabling Technology ***Description:*** This effort investigates distribution technologies for various obscurants. ***FY 2010 Accomplishments:***	0.830	0.904	0.970

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602622A: *Chemical, Smoke and Equipment Defeating Technology*	PROJECT 552: *SMOKE/NOVEL EFFECT MUN*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Conducted modeling and chamber evaluation studies to examine performance improvements possible for low hazard visual obscurants. ***FY 2011 Plans:*** Conduct studies of dissemination techniques for low hazard visual obscurants to increase their obscuration performance and to make them suitable for weaponization. ***FY 2012 Plans:*** Will refine and optimize new visual low hazard obscurants.			
Title: Forensic Analysis of Explosive Signatures ***Description:*** This effort will develop an understanding of signatures required to provide improved point, proximity, and stand-off detection of explosives and precursor materials. Will transition technologies to PE (0603004A/Project L97 (Smoke and Obscurants Advanced Technology). ***FY 2010 Accomplishments:*** Identified viable chemical signatures; initiated environmental persistence, fate and transport studies for chemical residues relevant to counter High Explosive (HE) and Home Made Explosive (HME) sensing operations; conducted experiments to develop novel forensic methods that determine the components in HMEs. ***FY 2011 Plans:*** Establish and validate forensic sampling protocols for sensing explosives on sufaces; identify the differences in instrumentation used in theater and within continental United States-based laboratories; continue fate and transport studies of trace energetics and chemical components focusing on surface residues; evaluate and determine decomposition patterns and pathways to provide additional signature markers; identify chemical signatures for sensing, leveraging data from DARPA Portable Open Source Security Elements (POSSE) program; investigate the ability to combine chemical and explosive hazard detection; and utilize findings to help guide detector/detection specifications. ***FY 2012 Plans:*** Will investigate improved signature information and novel algorithms and experimentally evaluate performance for explosives and precursor materials in existing chemical point and stand-off detection sensor systems.	2.868	3.020	2.507
Accomplishments/Planned Programs Subtotals	5.125	5.324	4.877

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602622A: *Chemical, Smoke and Equipment Defeating Technology*	PROJECT 552: *SMOKE/NOVEL EFFECT MUN*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602622A: *Chemical, Smoke and Equipment Defeating Technology*	PROJECT BA1: *Protection Technologies (CA)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
BA1: *Protection Technologies (CA)*	3.581	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Protection Technologies applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Highlander Electro-Optical Sensors ***Description:*** This is a Congressional Interest Item ***FY 2010 Accomplishments:*** This effort incorporated a hyperspectral imager on an unmanned aerial vehicle. The effort performed data reduction of the spectra and provide information to a ground station for action.	1.591	-	-
Title: Missouri Multi-Threat Detection Initiative (M2TDI) ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** The Multi-Threat Defeat Initiative developed standoff detection of CBRNE threats via common sensor platforms through signal processing and data fusion techniques which combined weakly-correlated data streams from multiple sensor modalities, auxiliary sensors, and time-series data, and improved system performance factors including detection sensitivity, selectivity, and the range of threats detectable with a single platform.	1.990	-	-
Accomplishments/Planned Programs Subtotals	3.581	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.